

R E M A R K S

I. INTRODUCTION

Applicant wants to thank the Examiner for his careful consideration of the subject application. Applicant has cancelled claims 22-33 and added new claims 34-49. Claims 34-49 are presently pending in the application. Applicant hereby requests further examination and reconsideration of the application in view of the foregoing amendments and the following arguments.

II. OBJECTIONS TO THE SPECIFICATION

Applicant has provided a substitute specification (unmarked specification) which addresses the Examiner's objections to the specification. Applicant has also provided a marked up version of the substitute specification showing all the changes to the specification. Applicant submits that no new matter has been introduced in the substitute specification.

III. REJECTION OF CLAIMS 22-33 UNDER 35 U.S.C. 103(a)

Claims 22-33 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Diehl (5,765,513) in view of Kato (6,224,034) and Ueda (5,150,020). Applicant has cancelled claims 22-33.

IV. NEW CLAIMS 34-49

Applicant has added new claims 34-49 to more clearly claim the Applicant's invention. Applicant will now discuss new claims 34-49 with respect to the references: (i) Diehl, (ii) Kato, and (iii) Ueda, used to reject the originally filed claims 22-33.

Referring to independent claim 34, a method for controlling an engine is provided. The method includes:

transferring electrical energy generated in a first electromechanical cylinder exhaust valve during closing of said first valve to a second electromechanical cylinder intake valve to open said second valve.

Claim 34 is similar to new method claims 37, 38, 39, 40, 41, 42, and system claim 48.

Applicant will now explain why a rejection of claim 34 (and claims 35-49) based on the three foregoing references would be improper. In particular, Applicant will show that: (i) there is no motivation provided in any of the references for the combination, and (ii) the combination does not teach all of the claimed limitations.

a. No motivation to combine

i. Diehl/Kato Combination

Referring to Diehl, an electromechanically actuated valve 18 is disclosed that utilizes three electromagnets (22, 30, 32) to actuate a valve 12. Diehl further discloses that valve 18 has both variable timing and lift and is capable of operating at speeds required for an engine. See Diehl, column 2, lines 27-30. After carefully reviewing Diehl, however, Applicant can find no teaching (or hint of any teaching) that it would be desirable for the electromagnets (22, 30, 43) (or any other component with Diehl) to be replaced by a motor driven mechanism of Kato. Nor has Applicant been able to find any such teaching in Kato.

The Examiner stated in the Office Action that the substitution of the motor of Kato in the Diehl system would be desirable for "flexibility in controlling the position and speed of the valve which allows adjusting the amount of opening of the valve." However, as discussed above, Diehl (by itself) can already adjust the "lift" (i.e., the amount of

opening of the valve." Further, Diehl can also adjust the valve timing. Accordingly, the Examiner has not identified any proper motivation in either of the references for the proposed combination.

Because the Examiner has not identified any proper motivation in either Diehl or Kato for the proposed combination, any rejection of claims 34-49 under 35 U.S.C. 103(a) using Diehl and Kato would be improper.

ii. Diehl/Kato/Ueda Combination

Referring to Ueda, an automatic string winder for winding string on a drum is disclosed. The string winder includes motors M1-M2n having motor windings U1-U2n driven by inverters I1-I2n. Inverters I1-I2n are connected via lines L1-L2n to an AC/DC converter 3. Further, the motors M1-M2n rotate unidirectionally to allow string to be wound on drums adjacent corresponding motors.

Referring to Figure 2, Ueda utilizes a triangular signal 5 to iteratively accelerate and decelerate the odd-numbered motors M2n-1 while such motors continue to rotate in the same direction. Similarly, a triangular signal 7 is utilized to iteratively accelerate and decelerate the even-numbered motors M2n while such motors continue to rotate in the same direction. The signals 5, 7 are out of phase with respect to one another so that the even-numbered motors are accelerated while the odd-numbered motors are decelerated, and vice versa. See Ueda, column 2, lines 57-65. The regenerative energy generated in the decelerating motors is utilized in the accelerating motors. See Ueda, column 3, lines 2-8.

Now lets assume that the teachings of Ueda, were applied to Kato. As discussed above, Ueda teaches controlling a motor to obtain unidirectional rotation, while accelerating and decelerating the motor rotation. If this methodology were applied to Kato, assuming clockwise rotation of the stepper motor 50, the motor 50 would be iteratively accelerated and decelerated toward an open position--until valve 7 (of Kato)

could no longer move any further axially. Further, since Ueda only teaches unidirectional control, the motor 50 would either (i) lock up once valve 7 (of Kato) reached a maximum possible axial open position, or (ii) drive the screw 25 (of Kato) out of the rotor portion 26 (of Kato). Further, since the motor 50 would only have unidirectional movement, motor 50 could never move the valve 7 to a closed position as required for valve operation in an engine cylinder. Accordingly, the combined teachings of Diehl, Ueda and Kato would result in an unworkable system for an internal combustion engine.

Because the combined teachings of Diehl, Kato, and Ueda would result in an unworkable system for an internal combustion system, none of the references provide any motivation for the proposed combination. Accordingly, any rejection of claims 34-49 under 35 U.S.C. 103(a) using these references would be improper.

b. combination of Diehl, Kato, Ueda does not teach all of the claimed limitations

Even assuming that Diehl, Kato, and Ueda were combined, the combination does not teach all of the limitations of claims 34-49. As discussed above, claim 34 recites:

transferring electrical energy generated in a first electromechanical cylinder exhaust valve during closing of said first valve to a second electromechanical cylinder intake valve to open said second valve.

Referring to Ueda, the reference does not teach transferring electrical energy generated while closing a valve, to a second valve to thereby open the second valve, as recited in claim 34. Further, neither Kato nor Diehl teach this step.

Similarly, the combination of these three references would also fail to teach the steps of claims 35-49.

Because the combined teachings of Diehl, Kato, and Ueda fail to teach all of the limitations of claims 34-49, any

rejection of claims 34-49 under 35 U.S.C. 103(a) using these references would be improper.

V. CONCLUSION

For the above-cited reasons, all the claims presently pending in this application are believed to be allowable. If the Examiner has any further questions or concerning regarding this matter, he is invited to call the Applicant's under signed attorney.

Respectfully submitted,


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